

Application No.: 10/015,701 Docket No.:8733.479.00
Response dated September 2, 2004
Reply to Office Action dated June 29, 2004

REMARKS

At the outset, the Examiner is thanked for the thorough review and consideration of the pending application. The Office Action dated June 29, 2004 has been received and its contents carefully reviewed.

By this Response, the specification and claims 1-3, 5 and 11 have been amended, and claim 10 has been cancelled without prejudice or disclaimer. No new matter has been added. Claims 1-9 and 11-28 are pending in the application with claims 6, 8, 16 and 21-28 being withdrawn from consideration. Applicant kindly acknowledges the withdrawal of the objection to claims 1, 10, 11 and 20. Reconsideration and withdrawal of the remaining objections and rejections are respectfully requested in view of the above amendments and the following remarks.

In the Office Action, claim 3 is objected to because of the recitation to the sealant. Applicant has amended claim 3. Accordingly, Applicant believes the objection is overcome. Withdrawal of the rejection is respectfully requested.

In the Office Action, claim 5 is objected to because the Office Action states "a substantially circular shape" is not supported in the specification. Applicant has amended the specification and claim 5 as presented in the originally filed specification. Applicant respectfully notes in the January 8, 2004 Office Action, the Examiner stated the meaning of "hole shape" was not clear. This prompted Applicant to attempt to clarify a meaning for examination. However, in the current Office Action, the Examiner has stated "a hole may have most any shape" and continued to object to claim 5. Accordingly, Applicant has removed "a substantially circular shape" from paragraph [0041] and claim 5 with the assumption that "hole shape" is clear to the Examiner. Withdrawal of the objection is respectfully requested.

In the Office Action, claim 7 is objected to because of the recitation "L-shaped channel". Applicant has amended the specification to clarify that the channel of the thin film transistor may be formed in an "L" or "U" shape, as supported in FIGs. 3A and 3B of the originally filed specification. Accordingly, Applicant believes the objection is overcome. Withdrawal of the rejection are requested.

In the Office Action, claim 7 is rejected under 35 U.S.C. § 112, first paragraph, as failing to comply with the written description requirement. Specifically, the Office Action alleges the limitation “L-shaped channel”, as presented in the Response filed April 8, 2004, is new matter. Applicant respectfully submits support for the limitation may be found in the originally filed specification, for example, in FIG. 3A. Reconsideration and withdrawal of the rejection are requested.

In the Office Action, claim 5 is rejected under 35 U.S.C. § 112, first paragraph, as failing to comply with the written description requirement. Specifically, the Office Action has alleged the limitation “substantially circular shape” is new matter. Applicant has amended claim 5. Reconsideration and withdrawal of the rejection are requested.

In the Office Action, claims 1, 7 and 10 are rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 6,130,729, issued to Oh et al. (hereafter “Oh”), in view of U.S. Patent No. 6,573,965, issued to Liu et al. (hereafter “Liu”), and further in view of U.S. Patent No. 6,055,035, issued to von Gutfeld et al. (hereafter “von Gutfeld”). Applicant respectfully traverses the rejection because neither Oh, Liu nor von Gutfeld, analyzed alone or in any combination, teaches or suggests the combined features recited in the claims of the present application. For example, Oh, Liu and von Gutfeld fail to teach or suggest a method of forming a liquid crystal display device that includes among other features:

“forming a dielectric frame having a first height and a sealant structure having a second height on a second substrate, the first height of the dielectric frame being different from the second height of the sealant structure, wherein the second height of the sealant structure is higher than the first height of the dielectric frame” as recited in independent claim 1 of the present application.

The Office Action concedes Oh does not explicitly disclose the combined features recited in the claims of the present application, and relies upon Liu and von Gutfeld to remedy the deficiencies of Oh. Specifically, the Office Action relies upon Liu to provide motivation to add a dielectric frame, and von Gutfeld to provide motivation to dispense liquid crystal on the first substrate. Applicant respectfully submits that even if the references were combined as suggested in the Office Action, the resulting combination would fail to teach all the features recited in the claims of the present application.

For example, with regard to the bumps formed on the pixel electrode in Liu, “the height of bumps is in the range of .5 μm to 4 μm ” (Col. 4, lines 65-66). And, when the bumps are formed on both substrates, the cell gap of the liquid crystal is not greater than the sum of the heights of two standing bumps on the upper and lower substrate respectively” (col. 5, lines 32-34 and FIG. 5). Applicant notes Liu fails to teach any relationship between the bumps and sealant structure. As such, Liu fails to teach a relationship between the dielectric frame and the sealant structure as recited in claim 1.

von Gutfeld discloses “a system for filling a display panel having first and second panel plates, with liquid crystal material” (Col. 2, lines 40-42). However, like Liu, von Getfeld fails to teach or suggest the structural relationships recited in independent claim 1 of the present application.

Because Liu and von Gutfeld fail to teach or suggest at least “forming a dielectric frame having a first height and a sealant structure having a second height on a second substrate, the first height of the dielectric frame being different from the second height of the sealant structure, wherein the second height of the sealant structure is higher than the first height of the dielectric frame” as recited in independent claim 1 of the present application, Liu and von Gutfeld do not remedy the deficient teachings of Oh such that one of ordinary skill in the art would be motivated to modify the device in Oh to obtain a method of forming a liquid crystal display device having the combined features recited in claim 1. Accordingly, claim 1 and its dependent, claim 7 are allowable over any combination of Oh, Liu and von Gutfeld. Reconsideration and withdrawal of the rejection are respectfully requested.

With regard to dependent claims 2-5, 9 and 12-14, Applicant respectfully submits these claims are patentable over any combination of Oh, Liu and von Gutfeld by virtue of their dependence from independent claim 1. Applicant has discussed above the allowable features of claim 1. Accordingly, claim 1 and its dependent claims 2-5, 9 and 12-14 are allowable over Oh, Liu and von Gutfeld. Reconsideration and withdrawal of the rejections of claims 2-5, 9 and 12-14 are respectfully requested.

In the Office Action, claims 11 and 20 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Oh, Liu and von Gutfeld in view of U.S. Patent No. 6,515,718, issued to

Kishimoto et al. (hereafter "Kishimoto"). Applicant traverses the rejection because neither Oh, Liu, von Gutfeld nor Kishimoto, analyzed alone or in any combination, teaches or suggests the combined features recited in the claims of the present application. As conceded on page 12 of the Office Action, "Oh, Liu and von Gutfeld do not explicitly disclose specific heights of dielectric structures with respect to seal heights". Applicant notes the Office Action makes a broad statement of what is "well known in the art" regarding motivations for establishing a cell gap without taking Official Notice or providing documentary evidence. Applicant requests, should this rejection be maintained, the Examiner to provide documentary evidence in the next Office Action.

The Office Action states "Kishimoto discloses the motivation to optimize the height of a dielectric structure to account for the relative dielectric constants of the respective components." Applicant respectfully notes that in various embodiments disclosed and claimed in the present application, the relationship between the height of the sealant and the height of the dielectric frame facilitates movement of the liquid crystal in the liquid crystal layer such that the dielectric frame does not hinder the movement of the liquid crystal and the liquid crystal is uniformly distributed on the substrate (See, for example, Specification, paragraphs [0021] and [0053]). Applicant submits Kishimoto does not teach the relationships recited in various claims of the present application and further fails to provide the motivation to one of ordinary skill in the art to modify a hypothetical device formed by the teachings of Oh, Liu and von Gutfeld in order to obtain a method recited in independent claim 1 and its dependent claims 11 and 20. Accordingly, claim 1 and its dependent claims 11 and 20 are patentable over Oh, Liu, von Gutfeld and Kishimoto. Reconsideration and withdrawal of the rejection are requested.

In the Office Action, claim 15 is rejected under 35 U.S.C. § 103(a) as being unpatentable over Oh, Liu von Gutfeld and U.S. Patent No. 6,603,528, issued to Tanaka et al. (hereafter "Tanaka"), and claims 17-19 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Oh, Liu, von Gutfeld and U.S. Patent No. 6,100,953, issued to Kim et al. (hereafter "Kim"). Claims 15 and 17-19 depend from independent claim 1, discussed above. Applicant respectfully traverses the rejections because neither Oh, Liu, von Gutfeld, Tanaka, nor Kim, analyzed alone or in any combination, teaches or suggests the combined features recited in the claims of the present application. For example, Oh, Liu, von Gutfeld, Tanaka, and Kim fail to teach:

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“forming a dielectric frame having a first height and a sealant structure having a second height on a second substrate, the first height of the dielectric frame being different from the second height of the sealant structure, wherein the second height of the sealant structure is higher than the first height of the dielectric frame” as recited in independent claim 1.

Tanaka discloses a device having “a plurality of spacers disposed in the gap over the wider and narrower gap regions” (Abstract). And, Kim discloses the use of negative uniaxial and negative biaxial phase compensation films (col. 5, line 66 - col. 6, line 12). However, neither Tanaka nor Kim teaches or suggests features that would provide proper motivation to one of ordinary skill in the art at the time of the invention to modify the hypothetical device of Oh, Liu and von Gutfeld to obtain a method of forming a liquid crystal display device having the combined features recited in independent claim 1 and its dependent claims 15 and 17-19 of the present application. Accordingly, claims 15 and 17-19, by virtue of their dependence from independent claim 1, are allowable over any combination of Oh, Liu, von Gutfeld, Tanaka and Kim. Reconsideration and withdrawal of the rejections are respectfully requested.

Applicant believes the foregoing amendments place the application in condition for allowance and early, favorable action is respectfully solicited. If for any reason the Examiner finds the application other than in condition for allowance, the Examiner is requested to call the undersigned attorney at (202) 496-7500 to discuss the steps necessary for placing the application in condition for allowance. All correspondence should continue to be sent to the below-listed address.

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If these papers are not considered timely filed by the Patent and Trademark Office, then a petition is hereby made under 37 C.F.R. §1.136, and any additional fees required under 37 C.F.R. §1.136 for any necessary extension of time, or any other fees required to complete the filing of this response, may be charged to Deposit Account No. 50-0911. Please credit any overpayment to deposit Account No. 50-0911. A duplicate copy of this sheet is enclosed.

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Respectfully submitted,

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